

Helen Bender – Submission:
Scientific Inquiry into Hydraulic Fracturing in the Northern Territory

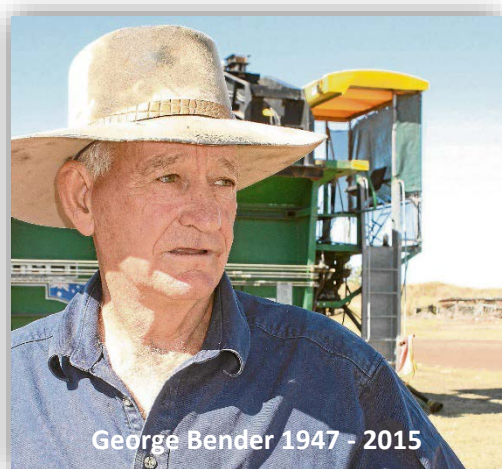
SCIENTIFIC INQUIRY INTO HYDRAULIC FRACTURING IN THE NORTHERN TERRITORY Draft Final Report

Helen Bender
Chinchilla, Queensland
02 February 2018

The Panel,

Thank you for accepting this submission to the Final Draft Report into the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory (Inquiry).

This submission relates to seeking feedback on the list of recommendations that the Panel has determined from their review into the risks associated with onshore unconventional gas extraction in the Northern Territory.



This submission is dedicated in loving memory of the late George Bender; who stood his ground for more than a decade to protect landholder rights and for the protection of our underground water system against CSG activities and unconventional gas mining

Executive Summary:

One could only wonder why a scientific paper provided such a bizarre introduction as was provided within the *Summary of the Draft Final Report*? The introduction that covered a story on DDT as presented in the book *Silent Spring* provided only half truths, a small portion of the history and minimal facts regarding how the use of DDT found its way into the agricultural industry. Was this a signal, a sign of what was to come from the 445 pages plus Appendices of the Draft Final Report? Was it an intentional attempt to obfuscate those time-poor individuals into an ideology of viewing farmers as being environmental vandals?

Please allow these missing facts to close the knowledge gaps and present the truth that had been overlooked, intentionally or otherwise on the history and facts about the use of DDT in agriculture to the Panel. While reading, consider switching the “DDT” for “onshore unconventional gas mining”.

DDT (Dichlorodiphenyltrichloroethane, chemical formula $C_{14}H_9Cl_5$) was first synthesised in 1874, but this compound sat on the shelf until 1939 when a Swiss biochemist Paul Hermann Müller discovered its potency as an all-purpose insecticide. Though he held no medical degree and had never engaged in medical research, Dr. Müller was awarded the Nobel Prize in Medicine in 1948 for none other, “for his discovery of the high efficiency of DDT as a contact poison against several arthropods.” The consensus would suggest that this award was a serious oversight due to the insufficient research that had been conducted on its long-term consequences to both human and environmental health.

The first use for DDT was not in the agricultural industry at all, it was first used in World War II where the U.S. and other governments jumped on its discovery because scientists knew that typhus was carried by fleas and malaria by mosquitoes. Hundreds of thousands U.S. soldiers were issued DDT powder and told to sprinkle it in their sleeping bags. Entire towns in Italy were dusted with DDT from the air to control lice. DDT was sprayed

heavily on South Pacific islands to control mosquitoes. Word got back to their home front that this new miracle chemical was saving the lives of loved ones.

DDT was a revolution in both ‘effectiveness’ and ‘safety’. Prior to DDT and other modern pest control agents, pesticides typically included poisons such as arsenic or cyanide, which often did more harm than good. Because DDT was the result of industrial engineering and scientific selection aimed specifically at fighting bugs and benefiting humans, it provided a new level of effectiveness and safety. It could kill bugs but also be eaten safely by humans supported by industry paid expert advice and backed by government agencies.

In 1940, the DDT formula was patented as a general insecticide and so began the marketing of the substance. Studies conducted by U.S. Department of Agriculture entomologists demonstrated beyond question that this new insecticide had tremendous possibilities not only against lice but also against several other noxious insects, such as mosquitoes and houseflies. With the help of the War Production Board, DDT was quickly put into large scale production. Now with the war’s end, the U.S. Public Health Service (PHS), along with the Tennessee Valley Authority and the Rockefeller Foundation, they began funding the large-scale use of DDT for malaria control.

By the 1950s DDT had become the most publicised synthetic chemical in the world. One American newspaper clipping service accumulated nearly 21,000 items about it in an eighteen-month period between 1944 and 1945. Most were glowingly enthusiastic; only a few questioned the mixed blessings of this new miracle compound. Dr. Clarence Cottam, Director of the Fish and Wildlife Service *urged forethought in 1945* when he stated, “**caution in its use is essential because of our incomplete knowledge of its action on many living things, both harmful and beneficial.**”

After World War II, the use of DDT expanded as farmers were encouraged by government to use DDT due to its effectiveness at controlling agricultural pests, and so DDT became the weapon of choice by many who incorrectly trusted the government. However, some insect populations evolved with a resistance to the insecticide...but that is another story. Now the truth begins to reveal itself, and the history of DDT starts to have an eerily correlation, a mirror image beings to be reflected into our present day about the apparent long-term benefits of the onshore unconventional gas industry, similar to those benefits of DDT.

Between 1947 and 1949, pesticide companies invested **\$3.8 billion** into expanding their production facilities, and one could only wonder what value of government subsidies were also provided to them? These companies were rewarded by huge profits. Many historians have called this the golden age of chemical pesticides – effective new chemicals were made readily available while ***all of the risks and dangers to human health and the environment were not yet known.***

There were many individuals at that time, and even still today who proclaim the heroically positive impact of DDT, while the modern environmentalist movement made DDT its number one target in the 1960s. In her famous book Silent Spring the environmentalist icon Rachel Carson chose DDT to demonise out of all the features of industrial capitalism. Evading its benefits for billions, she made allegations about detrimental effects of DDT and other pesticides on human health and that of various other species (especially birds), based on what has been quoted as ‘junk science’ and ‘anecdotes’ by the so-called industry backed scientific experts and industry pro-DDT pro-claimants.

Furthermore, history has confirmed that most pollution problems made their first appearance, or became very much worse, in the years following World War II. Many pollutants were totally absent before World War II, having made their environmental debut in the war years: smog, radioactive elements (war time atomic bomb), DDT, detergents, synthetic plastics. World War II is a decisive turning point in our historical transition. The 25yrs preceding the war was the main period of sweeping modern revolution in basic science, especially in physics and chemistry, upon which so much of the new productive technology is based. In the approximate period of the war itself, under the pressure of military demands, much of the new scientific knowledge was rapidly converted into new technologies and productive enterprises. Since the war, the technologies have rapidly transformed the nature of industrial and agricultural production.

Returning to the topic of DDT, Carson recognised that the direct kills were by no means the worst effect of DDT. More widespread and disastrous by far, were the delayed kills, coupled with the inhibition of

reproductive processes. Carson concluded that DDT had irrevocably harmed birds and animals and was contaminating the entire world's food supply. The book's most haunting and famous first chapter, "A Fable for Tomorrow," depicts a nameless American town where all life – from fish to birds to apple blossoms to children – have been "silenced" by the insidious effects of DDT. Although none of Carson's claims could withstand scrutiny, not even those about birds, the damage in public opinion was catastrophic. In the late 1960s and early 1970s, environmentalist and conservationist groups such as the Audubon Society and the Sierra Club spearheaded a call for a DDT ban.

In 1972, after 7 months of investigation of DDT by the newly founded Environmental Protection Agency (EPA), EPA administrative law judge Edmund Sweeney ruled against a ban. He found, based on the science presented, that "DDT is not a carcinogenic hazard to man," "DDT is not a mutagenic or teratogenic hazard to man," "The use of DDT under the regulations involved here do not have a deleterious effect on freshwater fish, estuarine organisms, wild birds or other wildlife," and that "The evidence in this proceeding supports the conclusion that there is a present need for the essential uses of DDT." It is recorded that EPA head William Ruckelshaus, overruled Sweeney and banned DDT for general use, stating that "the long-range risk of continued use of DDT...is unacceptable and outweighs any benefits," a statement many believed to have been based on blind anti-industrial ideology defying scientific evidence and decades of experience with widespread DDT use in the U.S. and elsewhere. Ruckelshaus never attended the 7-month investigation hearings. But he did apparently read *Silent Spring*; in his opinion and order he credited Rachel Carson's book for raising awareness of the widespread use of DDT and other pesticides.

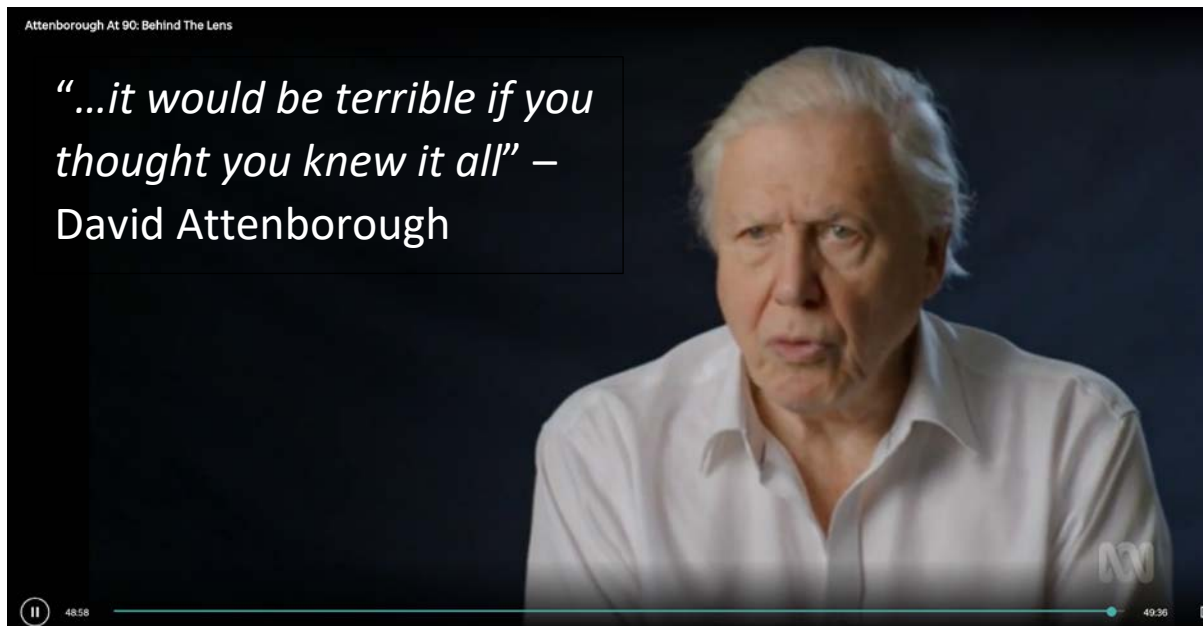
In conclusion, we don't need scientists, experts or other as we can rely on nature itself to find all our answers. As one of the laws of ecology suggests that the artificial introduction of an organic compound that does not already occur in nature itself but is man-made and is nevertheless active in a living system, is very likely to be harmful.

For many years industrial experts along with many government advisers spoke only of the advantages of DDT as an insecticide. But it was Rachel Carson who calmly and courageously unearthed the ecological facts and brought them eloquently to the public attention. Following her lead, other scientists spoke up. Armed with facts, citizens sued for action. Even though the U.S. market for DDT is now blocked, manufacturers increasingly ship the pesticide abroad where it is not banned.

The manner and the angle of the use of Carson within the introduction of the *Summary of the Draft Final Report* is nothing short of an attempt to obfuscate the reader, however upon presenting the other half of the facts including the history, it is advised that we all take a valuable lesson from the DDT story and avoid being swept up by the ideology of this Scientific Panel and follow Carson's approach by listening to the public, landholder's opinion about the very likely risk and harm of onshore unconventional gas mining within the Northern Territory.

And if Carson's warning wasn't enough, then the closing statement from the documentary, *Attenborough At 90: Behind The Lens*; where in David's closing statement he heeds warning to all individuals who claim that they are experts in their field, "it would be terrible if you thought you knew it all". Take a moment to reflect on the scale and volume of the unknown facts, the endless possible scientific alternative solutions and distorted realities that the long-term consequences that the proposed recommendations will have to the Northern Territory's net position once an onshore unconventional gas mining is unleashed and an irreversible path is laid down as the health of the land, water and air is sacrificed to benefit only a few multi-national corporations.

A very important question that every person in this country must answer..."Is it really all worth it?"



I have attempted to read the entire report however due to the limited time, I have not been able to fully complete a review and assessment of all proposed Recommendations. I have noted the following common concerns with the proposed Recommendations that appeared consistent across the board:

- Failure to indicate who will undertake proposed studies and modelling. The concern here that that the gas industry and government will undertake the research that the Paper has suggested, and as such the results and outcomes will not be independent or transparent as both entities have a vested interest
- There is no ability for any government in this country to be able to monitor or regulate this industry to any acceptable level that will mitigate risks, and due to this, but more importantly, the government cannot retain the experts with that level of knowledge or the required skillset with gas industry experience, thus allowing the industry to go self-regulated and self-monitored
- Generally, the Recommendations are not prescriptive enough to avoid industry loopholes. However, it is difficult to not be cynical to propose that this is the very intent of the Recommendations being written so lax
- The scientific papers as referenced in this Paper may seem thorough and extensive, though to the reader this wasn't overly reflected within the Paper itself. There was a general feeling that references included in the Paper had been cherry-picked and selectively presented with a view that there is minimal scientific research into the negative impacts of the onshore unconventional gas mining, and this is simply not true. Unfortunately, I did not have the spare capacity to undertake an assessment of the references used, however that is not to say that I won't complete this analysis to determine the ratio of pro-gas and anti-gas references. I completed a similar assessment against a CSIRO report on the Santos proposed Pilliga CSG project and found an alarming bias to pro-gas references. (Recommendation 12.16)
- The Health section completely ignored the real impacts due to psychiatric injury caused intentionally by the companies against landholders. The Panel cannot ignore the fact that Origin Energy is fully responsible for the death of Queensland farmer. The mental stress that the companies place landholders in has been completely ignored, and this is the greatest risk of them all. In addition, the fact is that this industry kills people has not been considered within the Paper
- The Panel's general assessment across all risks was determined to be rated as a "low" risk, that could "be mitigated" based on an assumption that regulations are fully implemented. However, there was significant knowledge gaps that the Panel didn't have available information on to make any determination. Without the actual investigations into the knowledge gaps, the Panel is not able to know everything. There was insufficient data to make any determination on groundwater use for fracking, contamination of groundwaters, aquatic eco-systems just to name a few.
- The industry or the industry paid 'experts' are not able to verify what is happening underground with any level of confidence that this Paper has relied upon or that the people of the Northern Territory require

Responses to Draft Final Report Recommendations have been provided in a Table format below:

Chapter 5 – Shale gas extraction and development
<p>Recommendation 5.1</p> <p>That the Government mandate a code of practice setting out minimum requirements for the abandonment of onshore shale gas wells in the NT. The code must be enforceable and include a requirement that:</p> <ul style="list-style-type: none"> • wells undergo pressure and cement integrity tests prior to abandonment, with any identified defects to be repaired prior to releasing the well for decommissioning; and • testing must be conducted to confirm that the plugs have been properly set in the well. <p>The recommendation does not take into consideration that the original asset owner will off-sell to a smaller less viable entity who will walk away from the obligations of plugging and abandoning as the fine will be cheaper than to carry out the P&A works.</p> <p>The Panel nor the Government can regulate the movement of asset ownership.</p> <p>Real Life Example: Santos were in a JV with Origin Energy and the leaking wells contaminated a potable aquifer with oil in the Surat Basin – RIVERSLEA FIELD. These leaking assets were left, ignored for decades, leaking and contaminating the aquifer. The evidence of these leaks were removed from the records as Santos & Origin off-loaded the ‘assets’ (insert the word LIABILITIES) to Armour Energy in 2017. No ASZ disclosure and Origin denied the leaks...unfortunately, records can never be deleted forever. Also, while asking for records of the leaking wells, ask about the 5km polypipe to replace the water that was being taken without a licence from the now very oily aquifer...and how much was paid to the landholder to be silenced?? Origin Staff were continuously asked to delete integrity and noncompliance issues before handing over documents under the sales purchase agreement. I wonder if Armour Energy have discovered the issue themselves yet?? If not, then it won’t be long. But here is something...the duty of care of the Queensland Government in being an accomplice in these environmental breaches and in assisting in covering-up the corporate criminal activities!</p>
<p>Recommendation 5.2</p> <p>That the Government mandate a program for the ongoing monitoring of abandoned shale gas wells in the NT. The program must include the ongoing monitoring of water quality by bores installed adjacent to the well and the results of such monitoring to be published in real-time.</p> <p>If the monitoring program is being undertaken by the government, this indicates that the Territory taxpayer will be paying for the monitoring program. What is the duration of the monitoring program? What is the ongoing costs to facilitate such a monitoring program for the proposed number of shale gas wells and bores?</p> <p>NT people are not requesting for monitoring programs on shale gas wells and water bores after the event, they are demanding that the shale gas wells are not drilled to begin with so that there is no risk to the quality of their water bores.</p> <p>Therefore, once the monitoring program determines that there is an issue, how will the issue be addressed, what will be the outcome for the owner of the impacted bore?</p>
<p>Recommendation 5.3</p> <p>That in consultation with industry and other stakeholders, the Government develop and mandate an enforceable code of practice setting out the minimum requirements that must be met to ensure the integrity of onshore shale gas wells in the NT. This code must require that:</p> <ul style="list-style-type: none"> • all onshore shale gas wells (including exploration wells constructed for the purposes of production testing) be constructed to at least a Category 9 (or equivalent) standard, with cementing extending up to at least the shallowest problematic hydrocarbon-bearing,

<p>organic carbon rich or saline aquifer zone;</p> <ul style="list-style-type: none"> • all wells be fully tested for integrity before and after hydraulic fracturing and the results be independently certified, with the immediate remediation of identified issues required; • an ongoing program of integrity testing be established for each well during its operational life. For example, every two years initially for a period of 10 years and then at five-yearly intervals thereafter to ensure that if any issues develop they are detected early and remediated; and • the results of all well integrity testing programs and any remedial actions undertaken be publicly reported.
<p>What is the definition of ‘enforceable’? Why are only minimum requirements being met? The issue remains, even after all the testing, how do you verify what is going on underground? Definition of ‘independently certified’? Neither the government departments (Territory or Federal level) or the industry can provide ‘independence’. How is this independent certifier remunerated? Given that the onshore shale gas industry is a ‘new’ industry in this country, where will the expert experience be obtained? 457 Visas? What has significant geological events not been considered as a trigger to complete additional integrity testing? Will the results be peer-reviewed?</p>
<p>Recommendation 5.4 That gas companies be required to develop and implement a well integrity management system for each well in compliance with ISO 16530-1:2017. That each well must have an approved well management plan in place that contains, at a minimum, the following elements:</p> <ul style="list-style-type: none"> • consideration of well integrity management across the well lifecycle; • a well integrity risk management process that documents how well integrity hazards are identified and risks assessed; • a well barrier plan containing well barrier performance standards, with specific reference to protection measures for beneficial use aquifers; • a process for periodically verifying well barrier integrity through the operational life of the well and immediately prior to abandonment, and for reporting to the regulator the findings from integrity assessments; • characterisation data for aquifers, saline water zones, and gas bearing zones in the formations intersected during drilling; and • monitoring methods to be used to detect migration of methane along the outside of the casing.
<p>Why are only minimum requirements being suggested by the Panel? Even with minimum requirements, there is no evidence to base a conclusion from that would confirm that a Well Integrity Management System or a Plan for each individual gas well, would or could mitigate the real risks to well integrity. In other words, how is a ‘System’ or ‘Plan’ filed on some server going to mitigate risks in a gasfield? A 2013 report issued by the Australia Council of Learned Academies predicted that over 50,000 fracked wells could extract the Northern Territory’s shale gas reserves, the Panel is therefore recommending that over 100,000 individual ‘Systems’ and ‘Plans’ be implemented and individually tracked and monitored. That is the reality of this recommendation. The Panel has failed to suggest how these Systems and Plans will be tracked and not lost in the bigger system. Also, no evidence has been provided on the well integrity improvements due to the implementation of this approach? Please supply the factual data on the improvements to well integrity, as at this stage, this is all hearsay statements.</p> <p>The Panel has suggested the recommendation that each well has the following:</p>

1. Well Integrity Management System for EACH well

- a. It is noted that the gas companies set out the REGULATOR'S responsibilities for review, assessment and inspection regime...isn't this a little backwards?
- b. The gas companies set out their own reporting requirements for WELL INTEGRITY INCIDENTS? The old story says, no reporting, no issues – how is the regulator going to know the unknowns?

2. Approved Well Management Plan – who approves the huge volume of Plans, this was not explicitly explained in the report? Who and how will EACH plan be verified, checked, confirmed when the Regulatory doesn't have the expert skills to approve such Plans?

- a. To be managed across the entire well lifecycle...is this even realistic, hence will this just be another failed attempt to hide behind more Plans, Systems and/or Reports?
- b. The gas companies are unable to manage the current liabilities, how could another layer of management make any improvements?

How will regulatory capture intended to be avoided?

In addition, what research has been completed on the sulfide generation by dominant Halanaerobium microorganisms in NT hydraulically fractured shales?

- Sulfide is a particular problem as it causes corrosion of steel infrastructure pipes by stimulating cathodic reactions that continuously leach protons from the metal
- Sulfide may also react with certain commonly used biocides, limiting their efficiency
- Sulfides readily complex with metal cations to form sparingly soluble precipitates that may drive decreased in permeability in newly fractured environments

In reviewing the Paper, there was no mention of Sulfides, this is a critical gap in your research.

Recommendation 5.5

That the composition (inorganics, organics and NORMs) of flowback fluids, in addition to hydraulic fracturing fluids, be made publicly available.

The Panel acknowledge that these chemicals do exist, however has been unable to confirm the actual chemical composition of the NT shale reserves to date. What scientific investigation will be completed to know the actual NORMs?

This suggests that the current operators have not undertaken any testing of the flowback water to date for disclosure to the Panel...or that they are not prepared to publicly disclose the data.

Will this data be researched and investigated prior to the Final Report?

Will the data be taken by a third party, independent from the operator? If not, what level of confidence will the public have on the data?

What level of flowback is considered unsafe for human and environmental health?

What level of enforcement will be provided to the regulator to shutdown the gasfield/well should flowback reach unacceptable levels to be brought to the surface?

The Panel needs to explain in detail the effects and consequences to the circle of ecology by the activities of hydraulic fracturing to bring to the surface of the volume of inorganics/organic and NORMS, VOC etc

What chemical reactions will take place between hydraulic fracturing fluids and NORMs? This is new research that is finding that there are additional chemical reactions taking place and producing different and harmful toxic cocktails.

Recommendation 5.6

That in consultation with industry and the community, the Government develop a wastewater management framework for any onshore shale gas industry. Consideration must be given to the likely volumes and nature of wastewaters that will be produced by the industry during the exploration and production phases.

That the absence of any treatment and disposal facilities in the NT for wastewater and brines produced by the industry be addressed as a matter of priority.

The Panel notes that the Industry needs to address the risk factor with transportation of waste a long distance...who is going to review and determine that the industry has adequately addressed the associated risk? The NT public do not trust the industry, and what opportunity for other States to object to wastes being transported into their own State? In addition, the Panel has stated that the Industry was unable to adequately address the situation in Queensland – it is the same industry that is pushing for this industry in the NT...what and who is stopping the industry from not simply repeating their mistakes?

The paper noted that “...20-50% of the volume of the initially injected water is returned to the surface as flowback water. Therefore, for a typical 20 ML total volume of water used to hydraulically fracture a horizontal well, approximately 4-10 ML could come back to the surface as flowback water.” Is this not of a concern to the Panel? It is a concern to myself and I suspect many others.

There is no certainty provided in the report on the treatment requirement or standards, hence the TOR has not been satisfied in this regard. Without knowing the actual wastewater treatment facility this element of the gas industry is incomplete.

The NT community need to be informed as to what has already happened to the wastewater and where if any illegal dumping has already occurred – that is, can it be proven that the volume generated in NT matches the volume received in Mt Isa, Qld? Was this investigated and verified by the Panel?

Recommendation 5.7

That in consultation with industry and the community specific guidance be implemented by the Government, drawing on protocols and procedures developed in other jurisdictions, for the characterisation, segregation, potential reuse and management of solid wastes produced by the shale gas industry.³

The Panel stated that there “...has been **no reported evidence** of fracturing fluid moving from the fractures to near surface aquifers.” Does this imply that there has been breaches that the industry has not bothered to report and hence there are unreported evidence...?

The Panel also stated “...Hydraulic fracturing has been taking place in the NT since 1967...” this is not the same technology that is currently in use today and the report must make this point clear to avoid confusion or be misleading.

The Industry has confirmed in the Paper that they do not have any idea as to how they will manage the solid waste...and yet the Industry is pushing for a green light and be allowed to figure it out as it goes along...history is repeating itself and the mess they created in Qld will follow the Industry across this country unless there is are stops in place. This is just one stop of many.

Recommendation 5.8

That to minimise the risk of occurrence of felt seismic events during hydraulic fracturing operations, a traffic light system for measured seismic intensity, similar to that in place in the UK, be implemented.

As evident in QLD, the Industry did not undertake an in-depth geological survey to identify existing fault lines (causing the Condamine River to bubble migrating methane), and the Paper confirms that there has been no investigation into the potential for seismic activity in the NT. Without complete and full knowledge of the landscape (both above and below ground) how is it possible that the industry can be so confident that they are aware of the real risks (these risks would be unknown-unknown risks).

Chapter 7 - Water

Recommendation 7.1

That before any production licence is granted to extract onshore shale gas, the Water Act be amended to require gas companies to obtain water extraction licences under that Act. That the Government introduce a charge on water in the NT for all onshore shale gas activities.

The Panel is commended on this recommendation to bring balance between the resource company and other water users. However, given the industry's viewpoint that groundwater is considered as a 'waste'...more stringent licencing requirements including higher charges be applied should the government wish to be seen to place the NT people before corporate profits. The Panel has suggested that \$1000/ML be applied, this charge should be at a rate as if there was no more water available for consumption in the NT.

The Paper states the following, "The second study is being undertaken by CSIRO, which has been engaged by **Origin and Santos** to characterise the groundwater environment, assess the flow mechanisms in the CLA, and assess the groundwater recharge rate and age of water in that aquifer. This study is expected to be completed by mid-2018."

There is very little confidence in the study being undertaken by Origin and Santos due to the following statement made by Larry Marshall head of CSIRO when explaining their business model: *"when we get funded, whoever the funder is, they're funding us to do something and they expect a deliverable, a result, so if we don't earn that, if we don't deliver that result they will cease funding us"*

Larry: (Chuckles) so chasing the dollar is not a strategic move. But, we absolutely are constrained by our funding envelope. So we try to secure funding to do things that we believe will build strategic value in the company. Sometimes that customer is the Federal Government, State Governments, industry, the public, but this funding, this revenue is not an entitlement, we have to earn that. When we get funded, whoever, the funder is, they're funding us to do something and they expect a deliverable, a result, so if we don't earn that, if we don't deliver that result they will cease funding us, and CSIRO has experienced that many times in the past. We also have to respond to shifts in global markets, as priorities shift, we have to recognise that and always be in a position where we're able to deliver the most value we can to our nation in response to those shifts.

CSIRO Chief Larry Marshall explains the new funding arrangements. February 2016

Also, clarification is required if CSIRO or GISERA are undertaking the study? Again, there is little confidence if GISERA are completing any study into the gas industry...the image below explains the lack of independence due to the entities involved in their funding



In addition, Santos, failed to adequately address the Groundwater topic in their EIS for the NSW project.

Furthermore, Origin failed to adequately address the Groundwater topic in their EIS for the Qld projects. Still to this day, Origin have failed to acknowledge the GDE's especially the Condamine River downstream of the Chinchilla Weir. The damage to this River is yet to be fully comprehended...however the industry has already set the pathway that they are prepared to commence their activities prior to understanding the significance of their environment. This is evident as exploration works have been approved to proceed without any thorough understanding of the environmental systems.

I also raise concerns that groundwater is not being tied to the land for the greed of a tradable water commodity.

Recommendation 7.2

That the Government request the Australian Government to amend the EPBC Act to apply the 'water trigger' to all onshore shale gas development.

Qld CSG industry history: After the outing of the then Minister Peter Garret in 2010, Burke approved the CSG industry within 2wks of becoming the Minister...he claims that his hands were tied in 2010 because he did not have the water trigger within the EPBC Act. However, this is not true as powers to assess impacts on GDEs were still under the EPBC...

Given that the knowledge of GDEs in the NT is limited, the Minister under the EPBC has enough power to not approve the activities based on legal requirements – the precautionary principle. In addition to GDEs, the Paper acknowledges that the Panel is not aware of any studies of stygofauna within aquifers in the NT, this also is sufficient evidence to not approve the industry under the EPBC using the precautionary principle.

The paper has not recommended for extensive studies to be undertaken prior to any decision on the current moratorium to be changed? The moratorium can not be changed until such knowledge is known based on the legal requirements under the EPBC Act.

This recommendation must be amended to include the legal requirement of the EPBC Act and based on limited to zero evidence the industry immediately is unable to proceed.

Recommendation 7.3

That the Government develop specific guidelines for human and environmental risk assessments for all onshore shale gas developments consistent with the National Chemicals Risk Assessment framework, including the national guidance manual for human and environmental risk

assessment for chemicals associated with CSG extraction.
<p>The concern is that the governments do not have the expertise or independence to undertake this task. Consideration must be given to who undertakes this task. Further to this, since it appears from reading the Paper to this stage, there are significant knowledge gaps to complete this assessment.</p> <p>It is noted that no gas company has bothered to undertake a risk assessment of their production wells. The gas industry are showing how they like to be proactive but instead walk the thin line of duty.</p> <p>Note 1: 20-50% of the volume of the initially injected water is returned to the surface as flowback water, and only 30-80% of the flowback water is recycled. This equates to 6-40% of the initial injected water being reused.</p> <p>Note 2: Hancock Prospecting has informed the Panel that it will relinquish portions of EP154 to allow a 25km buffer from the Mataranka Hot Springs and the Roper River and a 15km buffer from Elsey National Park. The question here is that scientific analysis may indicate that a distance required to be is twice or ten times than that nominated by Hancock Prospecting...a corporation such as Hancock Prospecting is not viewed by the Australian people as being generous or trustworthy.</p>
<p>Recommendation 7.4</p> <p>That a strategic regional environmental and baseline assessment (SREBA), including a regional groundwater model, be developed and undertaken for any prospective shale gas basin before any production licences are granted for shale gas activities in that basin, commencing with the Beetaloo Sub-basin.</p>
<p>Under this section, the Panel has not identified who will be undertaking the SREBA. This is important to ensure expert and independence from the government and industry, as both entities have a vested interest in the progression of the onshore unconventional gas industry. Therefore, only a third party who has no vested interest is to be sourced.</p> <p>A glance over Chapter 15 also did not detail who or how this SREBA would be undertaken, only the content to be covered by the SREBA.</p> <p>It was noted in a 2016 article, that the effects of hydraulic fracturing on groundwater and surface waters in not well understood and has been referred to as an uncontrolled science experiment on groundwater.¹</p> <p>The recommendations made in this Paper do not adequately consider the knowledge gaps of how proven contamination has occurred to groundwater from hydraulic fracturing. Will this be addressed in greater detail?</p>
<p>Recommendation 7.5</p> <p>That the use of all surface water resources for all onshore unconventional shale gas hydraulic fracturing in the NT be prohibited.</p>
<p>Who is going to monitor and regulate the industry to ensure that no surface water will be utilised in any activities – that is, the prohibited use of surface water to include all associated activities such as facilities, construction, dust suppression and the like?</p> <p>The Paper acknowledges the challenges to regulate the industry's use of surface water, and hence during the wet season will the surface waters be protected from dumping of industry wastes? The</p>

¹ Nikiforuk, A. Groundwater Contamination from Fracking Changes over Time: Study. www.Resilience.org

research and investigations in Qld and US indicate that this industry apply the aged old method “the solution to pollution is dilution”, hence utilising the wet season to minimise their waste obligations?

Recommendation 7.6

That in relation to the Beetaloo Sub-basin:

- the Daly-Roper WCD be extended south to include all the Beetaloo Sub-basin;
- a separate WAP be developed for the northern and southern regions of the Beetaloo Subbasin;
- the new northern Basin WAP provide for a water allocation rule that restricts the consumptive use to less than that which can be sustainably extracted without having adverse impacts on other users and the environment; and
- the southern Basin WAP prohibits water extraction for shale gas production until nature and extent of the groundwater resource and recharge rates in that area is quantified.

That in relation to other shale gas basins with similar or greater rainfall than the Beetaloo Sub-basin, WCDs be declared and WAPs be developed to specify sustainable groundwater extraction rates for shale gas production that will not have adverse impacts on existing users and the environment.

That in relation to other potential shale gas basins in semi-arid and arid regions, all groundwater extraction for any shale gas production be prohibited until there is sufficient information to demonstrate that it will have no adverse impacts on existing users and the environment.

The Paper states that the groundwater extraction for shale gas production, (it is noted that exploration has been excluded) should be prohibited until the groundwater is better understood. Also, that sustainable extraction limits should be set on the basis of the outputs from a regional numerical groundwater model developed as part of the SREBA...The Panel did not identify WHO would undertake this groundwater model, and if this entity would be completely independent from both the government and industry.

The groundwater model must also include the modelling to the repair to the aquifer due to the shale gas industry IF the industry was to proceed. This is a serious failure by the Queensland Government to allow unlimited water rights to the CSG industry without knowledge of the long-term consequences of the Great Artesian Basin.

Exploration activities are to be inclusive in all groundwater modelling.

Recommendation 7.7

That the following measures be mandated to ensure that any onshore shale gas development does not cause unacceptable local drawdown of aquifers:

- the drilling of onshore shale gas petroleum wells within 1 km of existing or proposed groundwater bores be prohibited unless hydrogeological investigations and groundwater modelling indicate that a different distance is appropriate, or if the landholder is in agreement with a closer distance;
- additional information on the aquifer characteristics is obtained as a result of the regional environmental and baseline assessment recommended in Section 7.4.1;
- relevant WAPs include provisions that adequately control both the rate and volume of water extraction by the gas companies;
- gas companies be required, at their expense, to monitor drawdown in local water supply bores; and
- companies be required to ‘make good’ any problems if this drawdown is found to be excessive (that is greater than 1 m).

The Paper provides a statement from Origin “...If a landholder’s business or **well-being** is adversely impacted...”. This statement given the direct involvement by Origin in the death of a Queensland farmer now has legal ramifications. Origin Energy were responsible for the death of a Queensland Farmer, George Bender, and this statement by Origin is a blatant lie as confirmed by

leaked information from within Origin Energy, backup by the Gasfield Commissioner who confirmed that the industry had to REVIEW their landholder negotiation practices AFTER the death of Mr Bender. This statement by Origin Energy now becomes a legal document to support the family's case.

Origin refused to negotiate fairly or reasonably in the Make Good provisions in Queensland, so why would Origin negotiate fairly or reasonably in the Northern Territory? The Panel is advised to not look at Origin words but to review and analysis their previous actions with landholders and place alternative methods in place to protect landholders from the bullying, threats, harassment and stress. It is not clear as to why landholders are not entitled to provide the distance from their own infrastructure and a 1km is determined? What guarantees will be offered by the government to not over time reduce this 1km should the industry be allowed to proceed?

This recommendation MUST also include all gas wells AND any bores drilled by the Industry to undertake their activities, such as gas industry water bores. That is, if groundwater is going to be used to supply the water for any shale gas development/activities, then their bores must also be included within the modelling.

Recommendation 7.8

That reinjection of wastewater into deep aquifers and conventional reservoirs should be prohibited until comprehensive geotechnical investigations are undertaken to show that no seismic activity will occur.

Has it been considered the reinjection of wastewater into conventional reservoirs and deep aquifers will not only have the potential to cause seismic activities caused by geological / aquifer deformation, however there are additional risks associated with fluid migration from such reservoirs or through the well casing itself during injection?

How will this risk be mitigated? Who will monitor the rejection in perpetuity?

Recommendation 7.9

That the following information about hydraulic fracturing fluids must be reported and publicly disclosed about hydraulic fracturing fluids prior to any hydraulic fracturing for onshore shale gas:

- the chemicals to be used;
- the purpose of the chemicals;
- how the chemicals will be managed on-site, including how spills will be prevented and if spills do occur how they will be remediated and managed; and
- the laws that apply to the management of the chemicals and how they are enforced.

That the following information about flowback and produced water be reported and publicly disclosed:

- the chemicals and NORMs found;
- how and where the chemicals and NORMs will be managed, transported and treated, including how spills will be prevented and if spills occur, how they will be remediated and managed; and
- the laws that apply to the management of the chemicals and NORMs and their enforcement.

This recommendation is lacking specific detail such as the minimum time required by the industry to provide this information and make it available.

What would be the benefit of this information being made to the public if the information is delayed and out of date? The information would need to be supplied within 24hrs.

As proven by the industry in Queensland, the database on well drilling is many years behind.

Santos has failed to publicly report groundwater monitoring portal that is now 2+years out of date...the industry has demonstrated that they are unable to publicly report information on any of their activities. Why would they be compliment in the NT?

The data on the NORMS must be investigated prior to any shale gas development and determined upfront on the risks.

All waste management is to be managed within the Northern Territory and not transported across the border.

Recommendation 7.10

That in order to minimise the risk of groundwater contamination from leaky gas wells:

- all wells to be hydraulically fractured must be constructed to at least Category 9 or equivalent and tested to ensure well integrity before and after hydraulic fracturing, with the results certified by the regulator (see also Recommendations 5.3 and 5.4);
- a minimum offset distance of at least 1 km between water supply bores and well pads must be adopted unless specific site-specific information is available to the contrary (see also Recommendation 7.7);
- a robust and rapid wastewater spill clean-up management plan must be prepared for each well pad to ensure immediate remediation in the event of a spill: and
- real-time publicly available groundwater quality monitoring must be implemented around each well pad to detect any groundwater contamination. Multilevel observation bores must be used to ensure full coverage of the aquifer horizon, with a level of vertical resolution sufficient to be able to identify the location of any leak.

Note: Path 8 is not indicated on Figure 7.10 on page 132 of the Report

Origin are responsible for leaky gas wells in Queensland that have gone unreported, how many leaky wells do Origin plan to have in the NT? Did the Panel's investigations uncover these leaky wells in Qld? Did Origin disclose the number of leaky wells in their submission? If not, why not? It is due to having a weak or completely no authority to regulate or monitor the industry's activities, that leaky wells go unreported – and the industry knows this. Hence, there is only one way to reduce the risk of contamination of groundwater would be to not allow this industry a foot-hold into the NT.

Summary of the key points, from internal Origin Energy Documents include:

- Evidence of oil contamination of a potable aquifer
- Origin failed to notify Dept of Environment Resource and Mines (DERM) of this contamination
- Grant King/Origin blatant denial that this contamination was the result of Origin's failure to maintain Surat Basin assets
- Multiple incidences of leaking gas wells (NOTE: PLURAL, MEANING MULTIPLE WELLS)
- Water off-take without appropriate licences
- Some wells were so badly neglected and ignored by Origin that they could not be located

All this and more, yet Grant King is on record lying through his teeth during the Whistleblower's legal case.

The Panel has incorrectly assessed the risks to leaky gas wells and the risk to groundwater contamination to be LOW. It is recommended that due to the industry being self-regulated, self-monitored, and no checks or balances to ensure that maintenance and construction standards that this risk is upgrade to HIGH.

It is advised that Origin Energy provide the Panel with a copy of their leaky well schedule.

Continuing...who and how is the industry going to be regulated? Governments do not have the necessary skills or knowledge to regulate this industry and are susceptible to regulatory capture.

Does this recommendation suggest that the industry will self-regulate and self-monitor? If so, this recommendation is not acceptable for the people of the NT.

As noted above, the industry has proven in Qld and NSW that they are unable to report data in a timely manner. How with the industry be any different in the NT?

What is the process to decontaminate an aquifer should the groundwater monitoring detect contamination? Who will be the independent body implementing this groundwater monitoring, as the industry must be kept at arm's length from this monitoring.

Recommendation 7.11

That to reduce the risk of contamination of surface aquifers from on-site spills of wastewater:

- the EMP for each well pad must include an enforceable wastewater management plan and spill management plan, which must be approved prior to the commencement of hydraulic fracturing;
- enclosed tanks must be used to hold all wastewater;
- the well pad site must be treated (for example, with a geomembrane) to prevent the infiltration of wastewater spills into underlying soil and thence into to an aquifer; and
- a real-time publicly accessible monitoring program for each well pad must be established.

Who is going to approve the management plans? No government in this country has the expertise or knowledge to regulate or monitor this industry.

The Industry has been witnessed to “dust suppress” with contaminated wastewater; drillers involved in the Qld gasfields have told of how there is wastewater dumped all through the gasfields. This has been allowed as there is no authority to regulate or monitor the industry's activities. Hence, there is only one method to reduce the risk of contamination of surface aquifers and that would be to not allow this industry a foot-hold into the NT.

Recommendation 7.12

That the Government undertake a review to determine:

- whether restrictions need to be placed on the transport of hydraulic fracturing chemicals and wastewater during the wet season, particularly on unsealed roads; and
- whether rail transport of some or all of the hydraulic fracturing chemicals and other consumables required should be used.

It is not a matter of whether, but to set the highest and strictest restrictions on this industry. It is not a matter if an accident will happen, but when will the accident happen.

And accidents do happen:

Rail Accidents:

<http://www.abc.net.au/news/2015-12-27/freight-train-derails-in-outback-queensland-near-julia-creek/7055686>

<https://www.theglobeandmail.com/news/national/river-turns-to-acid-as-train-derails/article17994406/>

Recommendation 7.13

That the reinjection of treated or untreated wastewaters (including brines) into aquifers not be permitted until detailed investigations are undertaken to determine whether or not the risks associated with this practice can be managed to acceptable levels.

Who will be undertaking this investigation? The industry and government (inclusive of CSIRO) have a vested interest and hence are not viewed as independent to trust any study undertake by them or of which they have provided funding for.

“risks...managed to acceptable levels” – acceptable levels to whom? To the industry or to the future generations?

Recommendation 7.14

That gas companies must submit details of all known fault locations and geomechanical planning to the regulator.

As witnessed in Queensland, the industry did not undertake thorough investigations into the natural faults and the possible consequences of these faults would have in the region – that being the bubbling of the Condamine River due to the depressurisation of the aquifers and migrating methane gas finding natural fault lines. Therefore, Origin do not take into consideration faults during their design stage and have made a false statement to the Panel.

Note: The groundwater modelling completed in Qld by OGIA, have also not included all known natural faults. It is recommended that all modelling that the Panel has suggested to be completed prior to any shale gas industry proceeding to include ALL faults and any geological irregularities into the model.

Recommendation 7.15

That appropriate site-specific modelling of the local groundwater system must be undertaken before any water is extracted for the purposes of onshore hydraulic fracturing for shale gas in order to ensure that there are no unacceptable impacts on groundwater quality and quantity.

Who will be undertaking this investigation? The industry and government (inclusive of CSIRO) have a vested interest and hence are not viewed as independent to trust any study undertake by them or of which the industry has provided funding towards.

See comments to Recommendation 7.7 above. The wording should not be limited to ‘hydraulic fracturing’ but for all industry related activities.

Recommendation 7.16

That the discharge of shale gas hydraulic fracturing wastewater (treated or untreated) to either drainage lines, waterways, temporary stream systems or waterholes not be permitted.

Support this Recommendation.

Who is going to monitor if this type of activity is not taking place and what would be the penalty should a company be found to be in breach?

Recommendation 7.17

That to minimise the adverse impacts of onshore shale gas infrastructure (roads and pipelines) on the flow and quality of surface waters, the Government must ensure that:

- landscape or regional impacts are considered in the design and planning phase of development to avoid unforeseen consequences arising from the incremental (piecemeal) rollout of linear infrastructure; and
- roads and pipeline corridors must be constructed to:
 - i. minimise the interference with wet season surface water flow paths;
 - ii. minimise erosion of exposed (road) surfaces and drains;
 - iii. ensure fauna passage at all stream crossings; and
 - iv. comply with relevant guidelines such as the International Erosion Control Association Best Practice for Erosion and Sediment Control and the Australian Pipeline Industry Association Code of Environmental Practice 2009.

As reported in Qld the industry is unable to construct pipelines or access roads that do not subside or change overland flow paths. The industry contract these works to subcontractors who are cowboys with a 'don't care attitude'...it is not their backyard, it is not their livelihoods that is being altered.

Origin have made 2 attempts to repair the pipeline subsidence and overland flow issues east of the property owned by the late George Bender, and there are still outstanding issues with this pipeline.

The Panel must understand the nature of the soils to correctly be able to assess the real risks associated with the long-term consequences of this industry cutting across the landscape.

Recommendation 7.18

That the Beetaloo Sub-basin SREBA should take into account all groundwater dependent ecosystems in the Roper River region.

Note: The Qld Gas Companies have failed to correctly identify known GDE's within the Surat Basin and hence the gas companies should not be trusted to undertake any SREBA study. See comments under Recommendation 7.4.

Recommendation 7.19

That the Beetaloo Sub-basin SREBA should take into account all subterranean aquatic ecosystems in the Roper River region.

See comments to Recommendation 7.4 and 7.18 above and apply the same.

Chapter 8 - Land

Recommendation 8.1

That strategic regional terrestrial biodiversity assessments are conducted as part of a SREBA for all bioregions prior to any onshore shale gas production, with all onshore shale gas development excluded from areas considered to be of high conservation value. The results of the SREBA must inform any decision to release land for exploration as specified in Recommendation 14.2 and be considered by the decision-maker in respect of any activity-based EMP.

As an example of why this recommendation sounds good in principle but is unable to deliver. I will use the Condamine River as an example. The River is a known major GDE however the gas industry and the government have refused to acknowledge that the terrestrial GDEs and aquatic GDE's are present.

I acknowledge that this example is 'water-related', however the principle still remains, that the government and industry are prepared to LIE and not disclose any environmental feature that may result in the industry not being able to complete their development.

Therefore, how will this recommendation ensure that the truth about terrestrial biodiversity is recorded? The assessment requires an entity that has no vested interest in the industry proceeding.

Recommendation 8.2

That a baseline assessment of all weeds within a permit area be conducted prior to any onshore shale gas exploration or development and that ongoing weed monitoring be undertaken to inform any weed management measures necessary to ensure no incursions or spread of weeds. Gas companies must have a dedicated weeds officer whose role is to monitor well pads, roads and pipeline corridors for weeds.

It has been witnessed by the industry that if they don't record the 'it', 'it' does not exist. Therefore, there is little trust in the industry to be concerned about weeds, due to not understanding the importance of the value of the land.

Recommendation 8.3

That gas companies be required to have a weed management plan in place prior to entering onto a petroleum permit. The plan must be consistent with all relevant statutory weed management plans and relevant threat abatement plans established under the EPBC Act.

As witnessed in Qld, gas companies can self-assess and complete weed and seed certificates, enter properties with expired certificates placing many properties at risk.

The industry (employees and subcontractors) have a long history trespass across properties without consideration – how will such breaches be managed within a Weed Management Plan?

Should there be an outbreak within the cattle industry (foot-mouth disease) the industry must commit to stop all activities immediately and take directions from the agricultural industry.

Recommendation 8.4

That gas companies be required to comply with any statutory regional fire management plan. The fire management plan should:

- address the impact that any onshore shale gas industry will have on fire regimes in the NT, and how those impacts should be managed;
- establish robust monitoring programs for assessing seasonal conditions and fuel loads;
- require that annual fire mapping be undertaken to monitor any increase in fire frequency due to any onshore shale gas development;
- require baseline data to be established for at least the decade prior to commencement of any onshore shale gas development; and
- require the implementation of management actions, such as prescribed fuel reduction burns at strategic locations, to reduce fuel loads and protect key values and assets if required on the basis of the annual fuel monitoring data.





(Photo 1 & 2: Credit to Carly Woostock)



Photos of potential fire loads generated by the gas industry in Qld. I provided the location of the dumped pipe cut-offs and liners had to be provided to the local fire brigade in the event of a bushfire for them to know where toxic hazards are present. The gas industry has completely no idea, forethought or care for the consequences caused by their activities or to the local lives placed at high risk of being incinerated.

Gas companies do not follow fire bans:

<https://independentaustralia.net/environment/environment-display/santos-csg-flaring-on-the-pilliga-makes-a-mockery-of-total-fire-ban,8468>

Consider the recent bushfire in the Pilliga State Forest, where Santos are planning to drill CSG wells. How good will a fire management plan be in this scenario?

<https://www.facebook.com/Prime7NewsNorthWest/videos/1676358715757593/>

Why did Santos refuse to comment? Because the gas industry don't have any idea or answers?

Will the fire management plan include the protection of local lives? The Paper only stated lives, but as has been the experience with dealing with the gas industry, these companies do not care about landholder's lives.

Recommendation 8.5

That as part of a SREBA, a study be undertaken to determine if any threatened species are likely to be affected by the cumulative effects of vegetation and habitat loss, and if so, that there be

ongoing monitoring of the populations of any such species. If monitoring reveals a decline in populations (compared with pre-development baselines), management plans aimed at mitigating these declines must be developed and implemented.

This recommendation reads in simplest terms... 'after there is a bigger problem to any already threatened species, a management plan will be written. This is a reactive and irresponsible approach.

Recommendation 8.6

That the area of vegetation cleared for infrastructure development (well pads, roads and pipeline corridors) be minimised through the efficient design of flowlines and access roads, and where possible, the co-location of shared infrastructure by gas companies.

The industry will not undertake this recommendation if it is cost prohibitive to themselves – however little concern do they have on the financial impacts to others.

It is of my opinion that the no infrastructure development is to scar any landscape. This industry has no concept of its own destruction and the Panel are putting up blinkers to the real long term consequences.

Recommendation 8.7

That well pads and pipeline corridors be progressively rehabilitated, with native vegetation re-established such that the corridors become ecologically integrated into the surrounding landscape.

What is the timing of the rehabilitation?

Here is a thought, do not allow the industry to progress and there is no requirement for this recommendation.

Recommendation 8.8

That to compensate for any local vegetation, habitat and biodiversity loss, the Government develop and implement an environmental offset policy to ensure that, where environmental impacts and risks are unable to be avoided or adequately mitigated, they are offset.

How many other subsidies, offsets, tax-free handouts could one industry need. If the industry requires any such handouts, then the risk is not able to be adequately mitigated and hence

Recommendation 8.10

That environmental legislation include a requirement for gas companies to identify critical habitats during corridor construction and select an appropriate mechanism to avoid detrimental impact on them.

The importance of accurately identifying critical habitats means that the industry cannot and must not be entrusted with this role and/or responsibility. There is sufficient evidence to indicate that the industry are not interested in protecting the environment.

Recommendation 8.11

That corridor widths be kept to a minimum, with pipelines and other linear infrastructure buried, except for necessary inspection points, and the disturbed ground revegetated.

Did the Panel take note of the minimum corridor widths use by the industry in Qld, or across other countries?

What is meant by minimum – specify this width. Minimum is relative...100m is considered minimum when compared to 1000m.

Recommendation 8.12

That directional drilling under stream crossings be used in preference to trenching unless

geomorphic and hydrological investigations confirm that trenching will have no detrimental impact on water flow patterns and waterhole water retention timing.

Pointless recommendation – this is how the industry has completed works in Qld and there have been impacts, just because the government turned a blind eye to the issues, doesn't mean that the harm isn't there.

Recommendation 8.13

That roads and pipeline surface water flow paths minimise erosion of all exposed surfaces and drains, and comply with design for fauna passage.

The industry has no understanding of how to do construct civil works to not cause impacts. Origin Energy have made 3 attempts to fix overland flow and subsidence of a pipeline in close proximity of our property and to date, there is still ongoing issues.

Here is a gas industry truck that is “dry bogged” across a gas pipeline – what is the impact of surface water flow paths here:

<https://www.facebook.com/GeorgeBender68/posts/1604739002975756>





Recommendation 8.14

That all corridors be constructed to minimise the interference with wet season stream crossings and comply with relevant guidelines, such as the International Erosion Control Association Best Practice for Erosion and Sediment Control and the Australian Pipeline Industry Association Code of Environmental Practice 2009.

It is in my opinion that this recommendation is unable to be achieved by the industry. There is a critical lack of skill to construct corridors to basic civil standards, that to meet the wet season stream crossings etc is beyond the capabilities of the industry. This would require extensive surveying and civil works that the industry would need to cut corners somewhere else.

Recommendation 8.15

That to minimise the impact of any onshore shale gas industry on landscape amenity, gas companies must demonstrate that they have minimised the surface footprint of development to ALARP, including that:

- well pads are spaced a minimum of 2 km apart; and
- the infrastructure within any development areas is not visible from major public roads.

What is the definition of ‘major public road’ – the Panel is to define this term from the Road Guidelines.

Recommendation 8.16

That the Government assess the impact that all heavy-vehicle traffic associated with any onshore shale gas industry will have on the NT’s transport system and develops a management plan to mitigate such impacts. Consideration must be given to:

- forecast traffic volume and roads used;
- the feasibility of using the existing Adelaide - Darwin railway line to reduce heavy-vehicle road use; and
- road upgrades.

Who is going to cover these costs?

<p>Recommendation 9.1</p> <p>That to reduce the risk of upstream methane emissions from onshore shale gas wells in the NT the Government implement the US EPA New Source Performance Standards of 2012 and 2016.</p>
<p>Recommendation 9.2</p> <p>That a code of practice be developed and implemented for the ongoing monitoring, detection and reporting of methane emissions from onshore shale gas fields and wells once production of any onshore shale gas commences.</p>
<p>Recommendation 9.3</p> <p>That baseline monitoring of methane concentrations be undertaken for at least one year prior to the commencement of shale gas production on a production licence.</p>
<p>Recommendation 9.4</p> <p>That baseline and ongoing monitoring be the responsibility of the regulator, undertaken by an independent third party, and funded by industry.</p> <p>Please determine what is considered ‘independent third party’?</p>
<p>Recommendation 9.5</p> <p>That all monitoring results should be published online on a continuous basis in real time.</p>
<p>Recommendation 9.6</p> <p>That once emission concentration limits are exceeded, the regulator must be notified, investigations must be undertaken to identify the source(s) of the excess levels, and make good provisions be undertaken by industry where necessary. These measures are to be the responsibility of industry.</p>
<p>Recommendation 9.7</p> <p>That the action framework outlined in Table 9.10 of the draft Final Report be implemented to mitigate any supplementary risks that may prevent the achievement of lower levels of fugitive methane emissions.</p>
<p>Chapter 10 – Public Health</p>
<p>Recommendation 10.1</p> <p>That formal site or regional-specific HHRA reports be prepared and approved prior to the grant of any production licence for the purpose of any shale gas development. Such HHRA reports to address the potential human exposures and health risks associated with the exploration for, and the production of, any shale gas development, off-site transport, and the decommissioning of wells, as recommended in NCRA guidance. The HHRA reports must include risk estimates assessments of exposure pathways that are deemed to be incomplete.</p> <p>The Panel has again failed to detail how and who will be undertake the regional-specific HHRA reports? This research and investigations are required to be undertaken by an entity that does not have a vested interest in the outcome of the industry, hence ruling out all government entities (Territory, State or Federal) or the industry itself.</p> <p>With respects to HHRA, the following weaknesses are noted:</p> <ul style="list-style-type: none"> the current system, is that useful information about human exposure is however not always available safety assessments predominantly rely on information obtained from studies performed in experimental animals – what is the relevance of effects in animals for the prediction of human adverse effects, or has the relevance of the use of animal model for humans is

uncertain or even the unknown level of uncertainty in the extrapolation of animal data to humans

- lack of suitable methods for determining complex substances (such as present in this situation and acknowledged by this Paper)
- it is not certain whether the HHRA approach covers all adverse effects relevant to human health
- there is a lack of information on susceptible groups of the population, which may be at higher risk

The Panel failed to acknowledge that the various uncertainties associated with the HHRA process have the potential to influence estimates of exposure and risk.

The methods and assumptions used in a HHRA provide a framework of LIMITATIONS that is associated with this method or current system.

Additional comments are included to this Paper, as it was noted that the Panel seems to have only limited themselves to industry-based research papers.

Furthermore, The Northern Territory people should refuse to accept this section of the Draft Final Report as being biased and lacking transparency. EnRiskS (Environmental Risk Science) whose name appeared in ways within this Paper raising enough curiosity to spark additional investigations. Here is a brief outline of what 10mins of research can determine:

- Founded in 2008 – a magical year of multiple stitch-ups to roll out the CSG industry and no doubt, the onshore gas mining across Australia. The number of criminal events that involved the government, industry and subsidiaries is a report in itself
- EnRiskS believe that there are **substantial flexibilities** that can be considered through the use of science-based approaches. As I have previously stated numerous of times, science can be manipulated for an outcome, and EnRiskS certainly have perfected lies to support the pro-gas claimants since 2008.
- Verification if EnRisk Services, Inc. that was founded in 1976 and is based in Fort Worth, Texas is the original parent company of the Australian arm? This alone would confirm that the EnRiskS is bias toward the industry
- EnRiskS completed reports directly for industry, hence paid for an outcome, and then are also asked to peer-review a HHRA report for Santos...does the Panel not see an issue with EnRiskS?
- Dr Adam Capon – Manager, Health Risk Policy Unit at NSW Inc (NSW Government) AND has a role within EnRiskS. Here are some interests facts to be considered about this individual:
 - his unique angle is “communicating about risks: strategies for situations where public concern is high but the risk is low” – it is no wonder the government and industry snap him up
 - Capon and his side-kicks basically present real impacts as alternative facts – this is alignment with the believe that EnRiskS that there are substantial flexibilities
 - This is from a paper he co-authored in 2017 regarding meeting the needs of the media²:

A careful media strategy can maximise the impact of mass media communication. It is not possible to discuss this extensively in this paper, but the basics include being readily available to talk to journalists, and to check and correct information; to use the ‘rule of 3s’ (in which three pieces of

² Hooker C, Capon A, Leask J. Communicating about risk: strategies for situations where public concern is high but the risk is low. Public Health Res Pract. 2017;27(1):e2711709.

information are most effective); and **to identify and use ‘agenda setting’ or gatekeeping journalists** – those who specialise in science and health communication, and whose articles and features set the framing and parameters of mass media communication. These journalists also often **act behind the scenes to correct their colleagues’ articles** and keep poor-quality reporting from publication. Specific strategies for the use of internet and social media are, of course, key aspects of good risk communication. Search engines mean that an audience can instantly check the accuracy of any assertion. Community moderators of social media information now play increasingly important gatekeeper roles in risk communication. For example, volunteer administrators of community Facebook sites can provide highly trusted, accurate information in response to community questions (about the safety of particular vaccines, for example) in real time, and correct misinformation and offer explanations where needed. Highly networked individuals and organisations can reach many people rapidly during a risk event.

- Remarkably, this paper perfectly reflects what the industry recently did under Hedley and Boris did to the article in The Australian on Dr GERALYN MCCARRON research on the links between CSG and increases in hospital administration. That is, the industry and government will use pro-gas media journalists to act as “gate-keepers”

All indications lead the reader to believe that the Panel would consider that a firm such as EnRiskS to be highly suitable to complete this recommendation, especially since the strategic experience of someone like Capon, who can advise on media strategies utilising “gate-keepers” to report on real facts as being ‘alternatives due to the science-based investigations manipulating the outcome for a paid result.

It is noted that the Panel reviewed the research by Brown, Winberger, Lewis, Bonaparte whose research found that the acute onset of health issues near gas facilities contrast with a subset of emissions research, which suggested that there is limited risk posed by unconventional gas development? Their inspection of the pathophysiological effects of acute toxic actions reveals that current environmental monitoring protocols are incompatible with the goal of protecting the health of those living and working near gas activities. It is noted that the Panel simply discredited this warning by claiming that the authors made no attempt to compare the estimated peaks and average exposures to health-based guidelines values. However, the paper clearly articulates the much of the publicly accessible emissions data has been collected to provide AVERAGE EXPOSURES over a lengthy period of time and because the data collection is intended to document compliance with regional air quality standards. It is therefore necessary to assess health impacts from human exposures in the short term. As noted in previous submissions to this Panel, human harm can be caused from just one peak exposure to an endocrine disruptor. The Panel has lacked foresight on this issue and are not acting within the duty of care obligations.

Recommendation 10.2

That to better inform the human health risk assessments, the following knowledge gaps must be addressed and published:

- contemporary knowledge of the chemicals proposed to be used in hydraulic fracking fluids for onshore shale gas extraction in the NT;
- details of the chemical composition of flowback and produced water in the NT; and
- the proposed methods of treatment and/or disposal of flowback and produced water.

The Panel has not considered that it is more than the knowledge gaps of the individual chemicals used, or the composition of the flowback and produced water that will alleviate landholders or concerned Territorians. There are significant gaps on the chemical interactions between each chemical, the peak exposures that are not recorded or considered in research due to guidelines that have excluded the importance of this measurement, or even the intensity or frequency of the exposures including the ongoing cumulative impacts that even small doses of contamination would do to human/livestock health.

In addition, in addition to my respond to Recommendation 5.4 regarding Sulfides:

- the toxicity associated with Sulfides poses health risks

It is unreasonable to assume that there are no health impacts in Qld, as data and reports are not being issued and some landholders are even going to the lengths of RTI to obtain air monitoring tests conducted on their own properties after years of being ignored by the Queensland Government. Currently, I am still following up with the government for reports on 2 air monitoring tests, one conducted in 2016, and one in 2017.

Dr Gerralyn McCarron has recently provided this research paper.

<http://www.tandfonline.com/doi/full/10.1080/00207233.2017.1413221>

Recommendation 10.3

That in consultation with industry, landowners and local communities, the regulator set appropriate setback distances to minimise risks identified in HHRA reports, including potential pathways for waterborne and airborne contaminants, for all shale gas development (exploration and production). Such setback distances to be not less than 1,600 m.

Here is a thought...set regulations that enable the landowners or local communities to VETO the industry. If the landowner or community do not wish to be placed in a position whereby there is a potential for health risks, then by law, they have all the legal backing to support their position to protect their health.

This this only true recommendation that will provide the Territorians with the balance position and the basic human rights.

Chapter 12 – Social Impacts

Recommendation 12.1

That as part of any strategic SIA early, and adequate consultation be undertaken on road use and related infrastructure requirements that result in realistic road upgrade and work schedules to support the required transport infrastructure for any unconventional shale gas industry and other users.

It is in my opinion that this recommendation has it backwards...meaning, that road upgrades and schedules will support the required transport infrastructure FIRST for other users and lastly for the gas industry.

SIA – in Section 12.4.2.1 it is noted that the SIA is a Government led. If the government approve the industry than there is an automatically a vested interest by the government, and therefore the SIA will be biased towards the outcome wanted by the government.

- I noted that the Paper spoke of surveys and the like undertaken in Chinchilla, and yet I do not know of one individual that has been involved with these surveys on SIA. Therefore, as a resident of Chinchilla it amazes me as to where or how the alleged statistics are reported??? There are real questions surrounding the integrity of any data coming from the gasfields of Queensland.

Note: The Panel refers to Recommendation 10.3 on pg 273 – there is no relevance to Recommendation 10.3 with this section of the paper.

Recommendation 12.2

That gas companies ensure the provision of adequate and sustainable funding to ensure the identified infrastructure requirements are met and maintained appropriately.

Northern Territorians need to be prepared for increases to their ‘rates’ to maintain the industry infrastructure needs.

Would the Panel consider that the government guarantee that no increased to rates or taxes due to industry infrastructure?

Recommendation 12.3

That consideration be given to the development of road use agreements between gas companies and local councils that include safety considerations and ensure monitoring for compliance, including reporting requirements.

This recommendation would have to be most unrealistic expectation. The mentality and behaviour of the common employee within this industry is nothing but complete contempt for the locals and their communities.

Local school buses are run off the roads, the most recent incident of a landholder who took photo evidence of the road trains causing dust nuisance, to have action taken for their own amenity...the truck driver stopped and threatened the landholders that he was going to “sort” them out. The Panel can view the threatened landholder’s comment on the George Bender’s Facebook page.

How will this recommendation be policed and monitored? Will it be a case of the local word against the industries word? Will the locals have to install in-vehicle camera’s and wear recording devices to support their case? Who will fund this need to equip locals to be able to monitor the real impact to their communities?

Recommendation 12.4

That gas companies be required to work closely with the Government and local communities early in any onshore shale gas development projects to ensure that any potential impacts on services are mitigated.

In all reality, it is impossible to comprehend how much closer the industry could get to the government...as it exists today, the gas industry controls the government.

The concern here is that there are communities in the NT who do not wish this industry upon their communities. Buying a SLO is not acceptable. Communities that have declared themselves gasfree are entitled to protect their communities. The government together with the industry must accept that fate.

Therefore, the Panel must include that communities are willing to refuse a SLO as an outcome within their Final Report.

Recommendation 12.5

That any strategic social impact assessment anticipates the long-term impacts and requirements for housing (not just through construction phase) to adequately mitigate the risk of inflated real estate prices and shortages within a community.

Could the Panel provide 3 examples of where the gas industry has not had any impact on the housing demand (in its entirety)?

From reading between the lines of this section, if the industry had been able to figure this issue out that they would have not made such a balls up in Queensland, whereby mum/dad investors are left with investment homes that remain empty, foreclosures, over supply of housing, the rush of the get rich quick developers cutting corners with whole estates being developed essentially overnight. How many decades does the industry require to learn from their own mistakes?

Lastly, local councils are just as much to blame in this mess as there is a invested interest during the initial boom period.

Recommendation 12.6

That in consultation with local communities, Aboriginal Land Councils, local government, and the Government, gas companies be required to provide accommodation, whether temporary or permanent, which must be completed prior to the construction/development phase.

Why is this a recommendation? Who else is responsible for accommodating the gas employees? It is my opinion that this recommendation should be in reverse...that is, that local councils/government are prohibited to approve any development or housing construction within any communities that is within the path of destruction by the gas industry. Only housing approvals may be granted (within the town planning guidelines or the like) to local, permanent residents only. This would remove the cowboy developers from the possibility of creating an over-supply of housing when the inevitable bust follows.

Recommendation 12.7

That there be a minimum standard set for gas companies to source goods, services and workers from local communities. This should include ensuring training programs are developed for Aboriginal and other local workers to develop the necessary skill sets and to improve their opportunities for local employment in any onshore shale gas industry.

Consideration should be provided to the fact that this onshore gas industry is a short-term industry, hence any employment is short-term, therefore consideration of transferable skills is most important.

The local workers will not be provided with the opportunities to work in positions that is too close to the high-risk activities for fear that these local workers will remain silent should they know of the real harm being caused by the industry, either by cutting corners, unreported events or the like. Local workers will be essential un-skilled labour.

Recommendation 12.8

That gas companies use a range of mediums to proactively work with local businesses to ensure they are able and adequately skilled to compete for contracts. They should follow the steps outlined above by the Queensland Gasfields Commission to assist them to be ready to participate in any economic opportunities that may emerge.

The ICN Gateway <http://gateway.icn.org.au/> didn't seem to be very successful for small contractors.

There is a concern with this recommendation, for local businesses to be adequately skilled and EQUIPED for the industry. Is it in the order of 9 out of 10 cases will require the local business to expand rapidly? Once the industry no longer requires this local business, the business is left with carrying the burden of having to expand to a level that is unsustainable resulting the complete loss of that local business by the end of the boom period. The industry is driven by profits, so they are the less likely to engage multiple small local contractors, therefore if the local contractor desire is to obtain this work they have no choice but to expand.

Also, as has occurred in Queensland, the gas industry companies refusal to pay the contractor in timely manner, resulting in the foreclosure of many local businesses. The local contractors are not commercially prepared for the nature of the gas industry contracts...many won't understand what contracts that they are signing, or the level of risk that they are taking on.

In addition, there are many many cases of the industry not paying contractors resulting in contractors having to foreclose and go into voluntary administration.

Recommendation 12.9

That the Government regulate to ensure that existing and future users of land can continue to enjoy their rights and interests in the land, including a mechanism to compensate for, among other things:

- loss of use of surface area where infrastructure is installed;
- diminution of the use made or that may be made of the land or any improvement on it;
- severance of any part of the land from other areas of the landholder's property; and
- any cost, damage or loss arising from the carrying out of activities on the land.

It appears that the Panel has not been able to comprehend that once your property is being mined by a gas company, the property is no longer considered the landholders. The industry takes free rein over your land, transforms the property into an industrialised wasteland. The industry employees do not follow the agreed land access rules, their mentality is that they are there to drill the living life out of the land.

This can be supported by a witness in Chinchilla who shared their direct experience to myself on a recent trip to Chinchilla, whereby there was an altercation with gas employees who openly spoke out their ill views and plans to walk over landholders, to drill the f@#k out their properties and do whatever they want. (If the Panel wishes to discuss this event with the witness from Chinchilla, please feel free to contact me for the contact details).

So...it is one thing to attempt to give the impression that the landholder is being considered in this debate, however there is a very deep and ill cultural problem that exist within this industry that will not be improved or changed overnight. This cultural problem can not be ignored by the Panel or the government. Landholder's are being pushed, and it is very likely that landholders are being pushed to take direct forced action.

The Panel acknowledges that there is a diminution in land value – therefore, please explain why would any landholder be expected to sign an agreement, or even bother to commence negotiations with a gas company? Compensation will not transfer to future generations, and this is important to a man on the land. If there is any risk that there is a diminution in land values due to the activities, landholders are entitled to refuse all offers presented by companies.

In terms of compensation, in Queensland the gas companies gag landholders, refuse landholder's lawyers to be present at negotiations, and hence, there is a huge discrepancy of what is a fair and reasonable compensation. Some landholders are receiving \$265/well, while others are being compensated for the full impact across the property, which equates to over \$15,000/well. The Panel have not addressed this issue in this section.

Where is the alternative solution? Landholders are granted the option to walk away from the negotiation table?

Recommendation 12.10

That gas companies be required to establish a relationship with communities to determine how to best facilitate community cohesion on an individual and collective level. This should be done in consultation with Aboriginal land councils and local councils, to ensure that the needs of all parties are accommodated.

The industry walks into a 'urban' community with a cheque book and commence buying out the community and progressively they take over the community events with their self-promoting banners and logos. Meanwhile, it is the 'rural' portion of the community who is at the forefront of losing their preferred lifestyle.

The Panel has not addressed the requirement that the industry is to establish a relationship without buying for it.

Recommendation 12.11

That gas companies must develop and implement a Social Impact Management Plan which details how they will optimise the relationship with the community prior to any onshore shale gas development. This plan must be developed in consultation with Aboriginal Land Councils and Local Councils to ensure that it meets community needs and be presented to the regulator for approval prior to any production approval being granted.

With all due respects – however this recommendation is meaningless. Should the industry proceed, there are communities who have agreed to remain gasfree. There will be no negotiations with these gasfree communities will agree to a Social Impact Management Plan.

This industry cannot be forced or willed onto communities any longer and the Final Report must recognise this fact and make adequate accommodation for it.

Recommendation 12.12

That gas companies be required to develop a Social Impact Management Plan that outlines how they intend to develop and continue their SLO within each of the communities they will operate in. This should be developed in conjunction with any SIA, and introduced as early as possible, preferably in the exploration phase, to ensure that any potential changes can be flagged in advance to allow communities time to adapt and prepare for the changes.

As above.

Recommendation 12.13

That a strategic SIA, separate from an Environmental Impact Statement, be conducted in advance of any onshore shale gas development, during the exploration phase. Such SIAs must be conducted holistically to anticipate any expected impacts on infrastructure and services, and to mitigate potential negative impacts, and be funded by industry.

Key words, "...funded by industry". The outcome will be as per the direction of the funder. The government and industry must be at arm's length from any research and reporting that will determine the communities' fate.

Recommendation 12.14

That early engagement and communication of the findings of the strategic SIA be systematically undertaken with all potentially affected communities and with all levels of government to ensure that unintended consequences are limited and shared understanding of roles and responsibilities, including financial responsibilities, can be developed.

As above – See Recommendation 12.11

Recommendation 12.15

That ongoing monitoring and measurement of social and cumulative impacts be undertaken with the results publicly available.

It is difficult to make comment on this recommendation. It raises more questions than answers.

Firstly, how will the ongoing monitoring and measurement physically be undertaken? That is, will there be a controlled group who will be monitored constantly? How would it be recorded if there have been any bribes paid by the industry to a participant? Will there be a balanced cross-section of participants? And if landholders have contracts that gag them from speaking?

The time delay between monitoring and making the results publicly available has not been defined. There is little value if the results are on a negative trend but the data is not available for months afterwards. All timeframes must be set and monetary penalties applied to any delays.

Recommendation 12.16

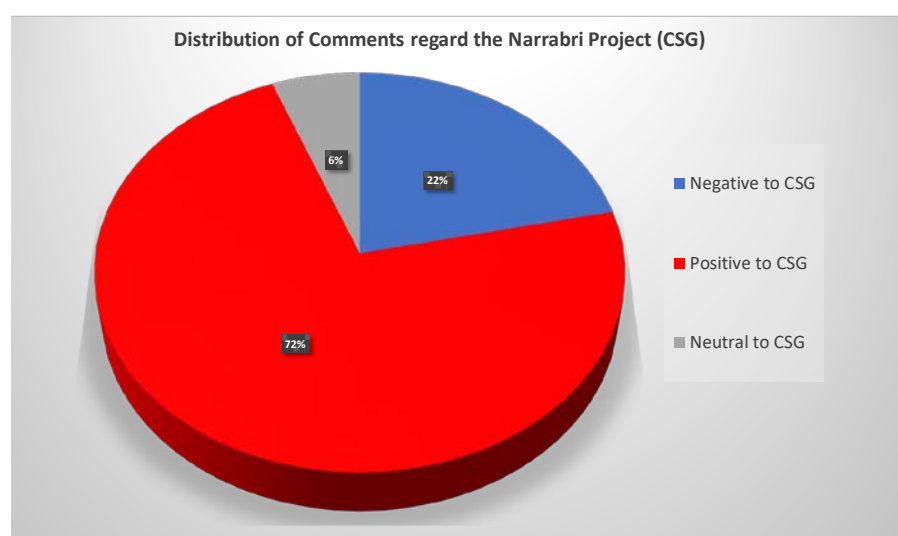
That in order to operationalise an SIA framework in the NT the Government should make the following structural reforms:

- introduce mechanisms for strategic assessment, either through a Strategic Assessment Agreement under the EBPC Act, or through reforms proposed in the 2015 Hawke Report. A strategic SIA is needed to decide if any onshore shale gas industry should go ahead, and if so, under what conditions;
- establish or enhance an independent authoritative body, such as the EPA or a newly established independent regulator (see Chapter 14), with powers to request information from, and to facilitate the collaboration between individual gas companies, and between gas companies, government agencies (including local government), communities and landholders;
- establish a long-term participatory regional monitoring framework, overseen by the EPA or the independent regulator, with secure funding (raised from industry levies) and able to endure multiple election cycles; and
- establish periodic and standardised reporting to communities on the social, economic and environmental performance of the industry through either the independent regulator or a specialised research institution. This includes information from the monitoring of key indicators, and an industry-wide complaints and escalation process.

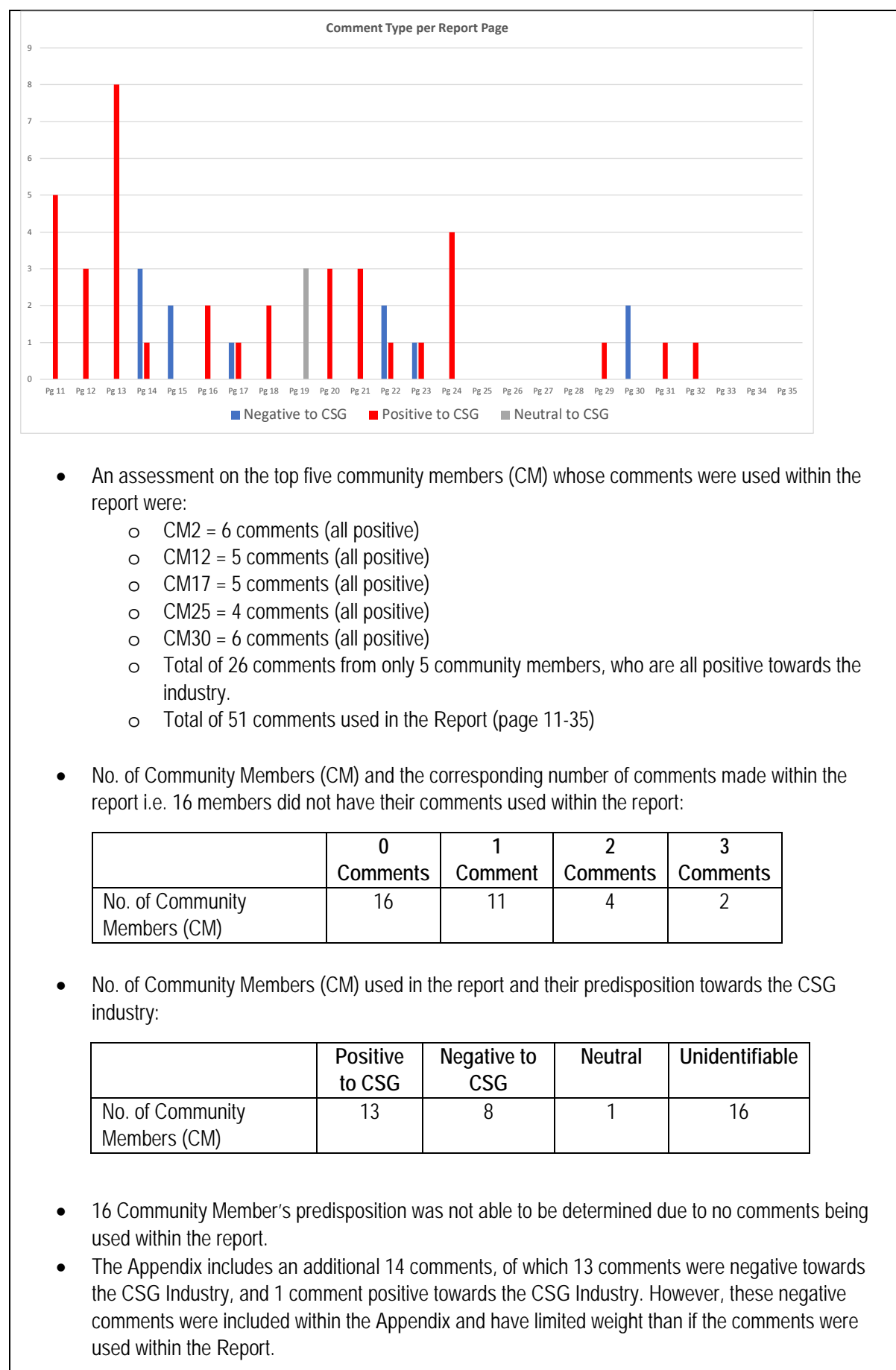
Example: Analysis into the level of bias reporting to a Social Baseline Assessment: Narrabri Project – Phase 2, CSIRO Report; Understanding local community expectations and perceptions of the CSG Sector, January 2017.

I completed an analysis into the bias reporting by CSIRO into the Narrabri Project on the Social Baseline Assessment. Below is a copy of my original comments:

- Distribution of comments within Report pages 11- 35: 72% positive comments used compared to 22% negative comments



- Distribution of comments across the Report pages 11-35: first negative comment was not until page 14 of the report.



In summary, the CSIRO-GISERA report was heavily biased towards the industry and did not attempt to present a fair and reasonable outcome. The distribution between using 72% positive comments across 13 community members, to 22% of negative comments across 8 members, while providing no comments from 16 other participants is grossly inadequate.

This above example is clear evidence that any such research institution such as CCSG, GISERA/CSIRO are funded and paid by the industry. How can there be in trust when their integrity is in the sewer?

It is easy to see how data can be manipulated to muddy the waters.

Chapter 14 – Regulatory Reform

Recommendation 14.1

That the Government design and implement a full cost recovery system for the regulation of any onshore shale gas industry.

Recommendation 14.2

That the Minister publish any proposed land release for any onshore shale gas exploration.

That the Minister must consult with the community and stakeholders and consider any comments received in relation to any proposed land release.

That the Minister be required to take into account the following matters when deciding whether or not to release land for exploration:

- the prospectivity of the land for petroleum;
- the possibility of coexistence between the onshore gas industry and any existing or future industries in the area; and
- whether the land is an area of intensive agriculture, high ecological value, high scenic value, culturally significant or strategic significance.

That the Minister publish a statement of reasons why the land has been released and why coexistence is deemed to be possible.

Recommendation 14.3

That Government consider mechanisms, including an amendment to the Petroleum Act, to ensure that applications that are currently extant are not granted in relation to areas that are not prospective for onshore shale gas or where coexistence is not possible. Consideration must be given to areas of intensive agriculture, high ecological value, high scenic value, cultural significance and strategic significance.

Recommendation 14.4

That the following areas must be declared reserved blocks under s 9 of the Petroleum Act, each with an appropriate buffer zone:

- areas of high tourism value;
- towns and residential areas (including areas that have assets of strategic importance to nearby residential areas);
- national parks;
- conservation reserves;
- areas of high ecological value; and
- areas of cultural significance.

Recommendation 14.5

That prior to undertaking any onshore shale gas activity on a Pastoral Lease (including exploration), a land access agreement must be signed by the Pastoral Lessee and the gas company.

That the land access agreement be required by legislation.

That breach of the land access agreement will be a breach of the relevant approval giving rise to the petroleum activity being carried out on the land.

This is a step in the correct direction for the landholders, however the Panel's view that the statutory right to veto is not an option requires reconsidering.

- Without the right to veto, gas companies have no requirement to fully disclose
- Landholders (freehold or lease) have the rights to protect their health and environment
- Landholders are not making claim over the mineral rights, it is the basic rights that a democratic country must provide their citizens

Recommendation 14.6

That in addition to any terms negotiated between the pastoralist and the gas company, the statutory land access agreement must contain standard minimum protections for pastoralists.

Comments by exception:

- Minimum notice periods
 - Orally is unacceptable
 - What constitutes an emergency?
- 'Obligation' defined to be a legally binding obligation, not a moral obligation
- Minimum amount...
- Make Good Provisions – must include all landholders impacted with or without infrastructure. E.g. contamination of surface/ground waters may impact landholders who do not have an agreement with a gas company. Without an agreement, these landholders have no course for compensation
- No confidentially clauses – companies are prohibited to bribe landholders i.e. a higher payment for the inclusion of such clauses
- Payment of reasonable fees by the companies – definition of 'reasonable', and this payment is not tied to a signed agreement
- The inclusion of INSURANCE must be provided by the gas companies that has no sunset date
- The inclusion that gas companies cannot block the landholder's legal team from the negotiation table

Recommendation 14.7

That the Government consider implementing a mandatory minimum compensation scheme payable to Pastoral Lessees for all onshore shale gas production on their Pastoral Lease. Compensation should be by reference to the number of wells drilled on the Pastoral Lease and the area of land cleared and rendered unavailable to the Pastoral Lessee.

A mandatory minimum compensation scheme payable, this is not to be taken by the industry as the maximum payable. Providing the right to veto would ensure that the gas companies would be required to enter negotiations with respect.

Improved value of the property – why? The Paper acknowledges that there is a risk that the gas industry will have a diminution impact on land values. Therefore, is this improved value to be taken as the greater of the before and after gas industry consequences to land values?

Recommendation 14.8

That the Government consider whether a royalty payment scheme should be implemented to compensate Pastoral Lessees for all new petroleum fields brought into production.

10% of \$0.00 = \$0.00

Gas companies are ensuring that they are minimising the royalty obligation paid, however the real impacts are the same to the landholder. What financial analysis has been completed to decide that 10% is sufficiently adequate to compensate a landholder? The number of variables would make this scheme complex and open for interruption and disagreements.

Recommendation 14.9

That any person may lodge an objection to the proposed grant of an exploration permit.
That the Minister must, in determining whether to grant or refuse the application, take into account the objections received, and that all objections received by the Minister be published.

Recommendation 14.10

That the Petroleum Act be amended to require the Minister to take into account and apply the principles of ESD.

Recommendation 14.11

That the Minister must not grant an exploration permit unless satisfied that the gas company is a fit and proper person, taking into account, among other things, the company's environmental history and history of compliance with the Petroleum Act and any other relevant petroleum legislation.
That the Minister's reasons for determining whether or not the gas company is a fit and proper person be published.

Recommendation 14.12

That Government develop a financial assurance framework for the onshore shale gas industry. The framework must:

- be transparent and developed in consultation with the community and key stakeholders;
- clarify the activities that require a bond or security to be in place and describe how the amount of the bond or security is calculated; and
- require the public disclosure of all financial assurances and the calculation methodology.

Recommendation 14.13

That the government impose a non-refundable levy for the long-term monitoring, management and remediation of abandoned onshore shale gas wells in the NT.

Recommendation 14.14

That all draft EMPs for hydraulic fracturing must be published and available for public comment prior to Ministerial approval.
That all comments made on draft EMPs be published.
That the Minister must take into account comments received during the public consultation period when assessing a draft EMP.

Recommendation 14.15

That all notices and reports of environmental incidents, including reports about reportable incidents under the Petroleum Environment Regulations, must be published.

Recommendation 14.16

That the Schedule be repealed and replaced with legislation to regulate seismic surveys, drilling, hydraulic fracturing, and well abandonment prior to the grant of any production licence for the purpose of any onshore shale gas development.

Recommendation 14.17

That the Government develop and implement enforceable codes of practice with minimum, prescriptive, standards and requirements to give clarity to the regulatory framework.
Recommendation 14.18 That the Minister must be satisfied that a gas company is a fit and proper person to hold a production licence prior to the licence being granted.
Recommendation 14.19 That, as part of the environmental assessment and approval process, the Minister be required to consider the cumulative impacts of any proposed onshore shale gas activity.
Recommendation 14.20 That the Government consider developing and implementing a regional or area-based assessment in the regulation of any onshore shale gas industry in the NT.
Recommendation 14.21 That the Petroleum Act and Petroleum Environment Regulations be amended to allow open standing to challenge administrative decisions made under these enactments.
Recommendation 14.22 That merits review be available in relation to decisions under the Petroleum Act and Petroleum Environment Regulations including, but not limited to, decisions in relation to the granting of exploration permits and approval of EMPs. That the following third parties, at a minimum, have standing to seek merits review: <ul style="list-style-type: none"> • proponents (that is, gas companies) who are seeking a permit, approval, application, licence or permission to engage in onshore shale gas activity; • persons who are directly or indirectly affected by the decision; • members of an organised environmental, community or industry group; • Aboriginal Land Councils; • local government bodies; and • persons who have made a genuine and valid objection during any assessment or approval process. That an independent body, such as NTCAT, be given jurisdiction to hear merits review proceedings in relation to any onshore shale gas industry.
Recommendation 14.23 Where litigation is brought genuinely in the public interest, that costs rules be amended to allow NT courts to not make an order for the payment of costs against an unsuccessful public interest litigant.
Recommendation 14.24 That the Government develop and implement a robust and transparent compliance monitoring strategy, having regard to the principles set out in the ANAO Administering Regulation: Achieving the right balance guide, and the policy in SA.
Recommendation 14.25 That the Government enact whistleblower protections. That a hotline be established to make anonymous reports about any onshore shale gas industry non-compliance and that such reports be investigated. Whistleblower protections are to include whistleblowers from private corporations.

The Panel is advised to review this Sydney Morning Herald article published on 27/01/2018:
<http://www.smh.com.au/comment/gender-equality-it-takes-a-troubled-woman-to-change-a-troubled-world-20180125-h0oip9.html>

Of specific interest within the above article is this paragraph below:

That's kinda funny – until you realise it's still happening. Tony Abbott's disgraceful "ditch the witch" moment over Julia Gillard. The alleged detention and forced medication in Queensland under Fixated Persons laws (yes, NSW has them too) of former Origin Energy executive and whistleblower Fiona Wilson. When women get uppity they're demonised and punished. Yet so often troubled women's trouble is just being female in a world that suits and favours men.

For your convenience is the direct link with the article:

<https://www.facebook.com/GeorgeBender68/posts/1607788959337427>

The list of non-compliance and evidence extends to Origin Energy's exploration activities in the Northern Territory. Evidence that has been personally sighted.

Recommendation 14.26

That the Government consider developing and implementing a tiered regulatory model such as the one in SA, whereby gas companies with a demonstrated record of good governance and compliance require a lower level of monitoring, with a corresponding reduction in regulatory fees.

Recommendation 14.27

That the Government enact a broader range of powers to sanctions, including but not limited to:

- remediation orders;
- enforceable undertakings;
- injunctions; and
- civil penalties.

Recommendation 14.28

That the Government allow civil enforcement proceedings to be instituted to enforce potential or actual non-compliance with the legislation governing any onshore shale gas industry.

Recommendation 14.29

That the Government consider enacting provisions that reverse the onus of proof or create rebuttable presumptions for pollution and environmental harm offences for all regulated onshore shale gas activities.

Recommendation 14.30

That penalties for environmental harm under the Petroleum Act and Petroleum Environment Regulations be reviewed and increased in line with leading practice.

Recommendation 14.31

That in order to ensure independence and accountability, there must be a clear separation between the agency with responsibility for regulating any onshore shale gas industry and the agency responsible for promoting that industry.

Recommendation 14.32

That the Government develop and implement the reforms described in Option 1 and/or Option 2 above prior to any production licences being issued for any onshore shale gas activities in the NT.

Chapter 15 – Strategic Regional Environmental and Baseline Assessment
Recommendation 15.1
That a strategic regional environmental and baseline assessment (SREBA) be undertaken prior to the grant of any production licence for onshore shale gas.
Under this section, the Panel has not identified who will be undertaking the SREBA. This is important to ensure expert and independence from the government and industry, as both entities have a vested interest in the progression of the onshore unconventional gas industry.
A glance over Chapter 15 also did not detail who or how this SREBA would be undertaken, only the content to be covered by the SREBA.